Scientific American.

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RUFUS PORTER, EDITOR.

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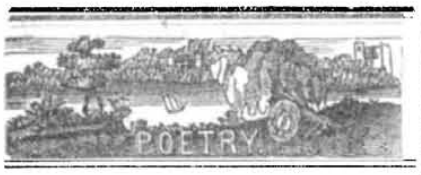
☞ *See Advertisement on last page.*



BE NOT OVER NICE.

Young gents, if you dont wish to be,
For remnant of your years,
The thing that Franklin used to call
A "half a pair of shears;"
Pray let me whisper in your ear
A word of good advice—
Don't think to find *perfection* here,
And be not *over nice.*

Take warning by my cousin Jack,
Nor in his footsteps tread;
Oh, how I've teased and talked to him,
And tried to make him wed;—
But he is so *particular,*
So *shy* of all the fair,
He'll be a blue old bachelor
In spite of all my care.

One is in height a mountain oak:
A second like a tub;
A third has got a mammoth foot:
Another's nose is snub.
One cannot brew, or bake, or sweep;
Another cannot play;
Another's always in the suds;
Another quite to gay.

Miss A good dough-nuts cannot make;
Miss B is said to paint,
Miss C is wilder than the winds,
Miss D too much a saint;
Miss E is careless in her dress,
Miss F is too precise,
Miss G is prone to take Scotch snuff,
Miss H is fond of dice.

Miss I is silent as a doll,
Miss J a perfect parrot,
Miss K has flaxen colored locks,
Miss L's are like a carrot.
Miss M is always looking grum,
Miss N forever gigling,
Miss O is stiffer than a stake,
Miss P is loose and wriggling.

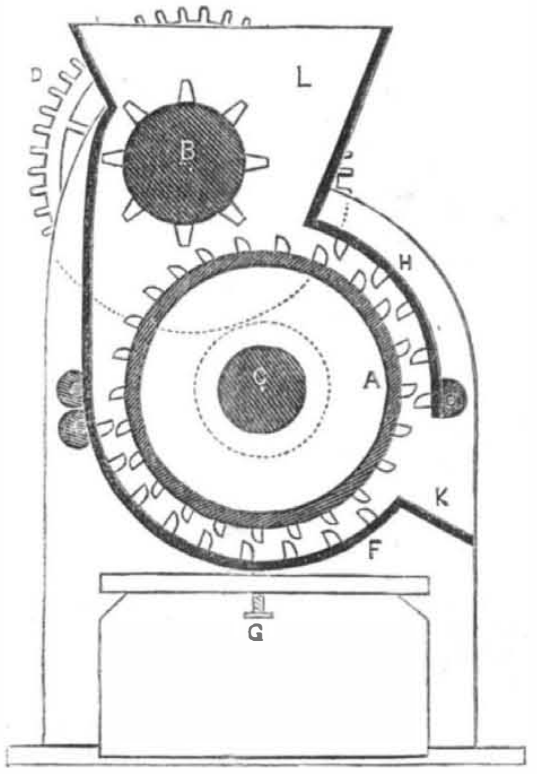
Miss Q is cold as wintry ice,
Miss R to fond of fawning,
Miss S has got defective teeth,
Miss T was caught a yawning,
Miss U for eyes has got an owl's,
Miss V a pair that squint,
Miss W's temper's soft as wax,
Miss X's as steel and flint.

Miss Y is past a certain age,
Miss Z a thoughtless miss,
And so with all some fault he finds,
Nor fancies that or this.
He's managed so with all the girls,
That they are all provoked;
And sure I am that ne'er he'll be
With any maiden yoked.

So gents, I prithee take good heed—
Avoid Jack's grevious errors,
And soon you'll find that pretty girls
Are clad no more in terrors.
And when you meet a sparkling eye,
With soul and feeling lighted,
Remember that it speaks a hint
Which may not well be slighted.

POLLY.

BEALS' CRACKING MILL.



[Communicated by Z C. Robbins, Patent Agent, Washington, D. C.]

This is for a machine for cracking and grinding corn with the cobs, or other substances; in the accompanying drawing, L, is the hopper in which the substances to be acted upon are placed,—A is the main cylinder armed with teeth, secured to, and revolving on the main driving shaft C; B is a toothed cylinder one-fourth the diameter of A, and placed over the same, the teeth of the two cylinders passing between, but not in very close proximity to each other F is an adjustable toothed concave, placed under the main cylinder A, and G is a set screw for regulating its distance from the same; the teeth in the concave, pass between and are in close proximity to the teeth on the main cylinder.

D is a cogwheel on the arbor of cylinder B, which is geared into and receives motion from a pinion on the main shaft C. K is the discharging aperture: H is a tooth cleaning concave, placed between the aperture K, and the hopper. The operation of the machine is as follows;—motion having been given to the driving shaft, the corn and cobs, (or other substances) as they are placed in the hopper, fall on to the main cylinder, and are carried forward by it under the cylinder B, and are cracked in passing between the teeth of the same; they then fall into the adjustably concave F, and are ground to a desired degree of fineness in passing through the same, to the discharging aperture, by the action of the teeth on the main cylinder in consunction with those in the concave:—the degree of fineness being regulated by the set screw G. Any particles that should adhere to the teeth of the main cylinder, are removed by the teeth of the cleaning cylinder H. Claim: Having thus fully described our invention, what we claim therein as new, and desire to secure by letters patent is, the combination of the main cylinder A, with the small cylinder B, (revolving in an opposite direction at a slower speed,) the adjustable concave F, and the cleaning concave H, respectively armed with teeth, and operating substantially in the manner and for the purpose herein set forth.

Patented Dec. 17th 1846 by William Beat, of Norway, Me. and E. S. Hale, of Lowell, Mass.

A LIST OF PATENTS

Issued from the 19th of December to the 26th of December, 1846, inclusive.

To D. Stillwell, of Philadelphia, for improvement in Snow Plough. Patented 22d Dec. 1846.

To J. S. Silver, of New York, for improvement in Cooking Stoves. Patented 22d Dec. 1846.

To Samuel Cope, of Salem, Ohio, for improvement in self acting carriage breaks.—Patented 22d Dec. 1846,

To Edwin Keith, of Bridgewater, Mass. for improvement in Cotton Gins. Patented 22d Dec. 1846.

To George Edelman, of Philadelphia, Penn for improvement for machines for calculating. Patented 22d Dec. 1846.

To Samuel D. Anthony, and Danl. Barnum, of New York, for improvement in preventing incrustation of Steam Boilers. Patented 22d Dec. 1846.

To John R. Remington of Lownds Co. Alabama, for improvement in coffee pots. Patented 22d Dec. 1846

To Benjamin Shepard of Boston, Mass. for improvement in air heating stoves. Patented 23d Dec. 1846.

To Hezekiah Augur, of New Haven, Conn. for improvement in machines for carving. Patented 23d Dec. 1846.

Railway Travelling in America.

The American railway carriage is a long omnibus built apartment, capable of holding fifty persons. It is fitted up with a series of well cushioned seats, each seat holds two persons, and right through the centre of them is an open passage for the egress and ingress of all who wish to move. When the train is in full motion the collector or conductor walks through his long train of carriages surveying his passengers, collecting their tickets, &c.—The company generally consists of one half ladies, who have in these railway conveyances no exclusive seat rooms, they are perfect heroines in travel. An American lady, married or unmarried, will pass, unaccompanied, 300 miles in the railway cars or steamboats. In this they are perfectly safe from the slightest molestation, the most respectful bearing is manifested toward them by the other sex.—This fact is no small compliment to the good manners that prevail in American society.—*English Paper.*

They have got an ice bridge in Albany over which loaded teams have been passing.

List of English Patents granted for the week ending October the 29th, 1846.

Etienne Abraham Maccaud, of No. 1, Place de la Madeliene, Paris, mechanician, for improvement in lamp and gas burners. Oct. 22.

John James Alexander Maccarshy, of Sidney terrace, Brompton, gentleman, for certain improvements in anchors and fids for masts of vessels. Oct. 22.

William Anderson, of Clitheroe, Lancaster, for certain improvements in machinery and apparatus for preparing and spinning cotton, and other fibrous substances. Oct. 22.

John Paterson Reid, of the city of Glasgow, and Thomas Johnson, mechanic, for certain improvements in machinery for weaving, and for producing patterns in weaving, as also in machinery for finishing woven fabrics. Oct. 22.

James Thomas Jullion, of Stratford, chemist, for improvements in the manufacture of certain acids, also improvement in decomposing certain acids, and applying the products resulting therefrom, to the production of certain chemical compounds. October 22.

James Lysander Hale, of Hackney, Middlesex, civil engineer, for certain improvements in sewerage and drainage, and apparatus connected therewith, parts of which are applicable to steam engines. Oct. 22.

John Hutton, of Commercial-road, East, chronometer maker, for certain improvements in chronometers and other time-keepers,

Henry Mapple of Child's Hill, Hendon, Middlesex, machinist, for improvements in apparatus, for transmitting electricity between distant places, and in electric telegraphs.

William Crane Wilkins, of Long Acre, Middlesex, for certain improvements in lamps and apparatus connected therewith, parts of which are also applicable to the raising of water. Oct. 29.

William Reid, of Saint Pancras, Middlesex, engineer, for improvements in the manufacture of wire. Oct. 29.

List of Irish Patents from the 21st of September, to the 21st of October, 1846.

William Pidding, of Wigmore-street, in the county of Middlesex, gentleman, for improved process for preserving the flavor of coffee and cocoa, or of any preparations thereof, from the effects of the atmosphere, 24th September, 1846.

Francois Stanilas Meldon de Sussex, of Millwall, in the county of Middlesex, manufacturing chemist, for improvement in the manufacture of soda and potash. October 7th, 1846.

Bennett Woodcroft, of Manchester, county of Lancaster, consulting engineer, for an improved mode of printing certain colors on calico and other fabrics. Oct. 7th. 1846.

Josue Heilmann, of Mulhausen, in the Department Du haut Rhine, in the Kingdom, of France, machine maker, for improvement in certain machines used for preparing to be spun cotton, wool, and other fibrous materials. October 7th, 1846.

Hugh Greaves, of Hulme, in the parish of Manchester, in the county of Lancaster, engineer, for improvements in the construction of railways, and in the vehicles to be used thereon. Oct. 10th, 1846.

John Augustin Alexis Sauvage, of Rue Richer, Paris, in the Kingdom of France, machinist, for improvements in condensing the steam of steam engines, and in supplying water to steam engine boilers. October 10th, 1846.

Augustus William Hillary, No. 66, Cadogan-place, Chelsea, but at present residing at No. 146 Avenue des Champs Elysees, in the city of Paris, Esquire, for Improvements in the manufacture of gas. Oct. 10th, 1846.

Seven boats, each 40 feet long, 12 feet wide, and 4 feet deep, are in progress and nearly completed at Bristol, R. I. for government.

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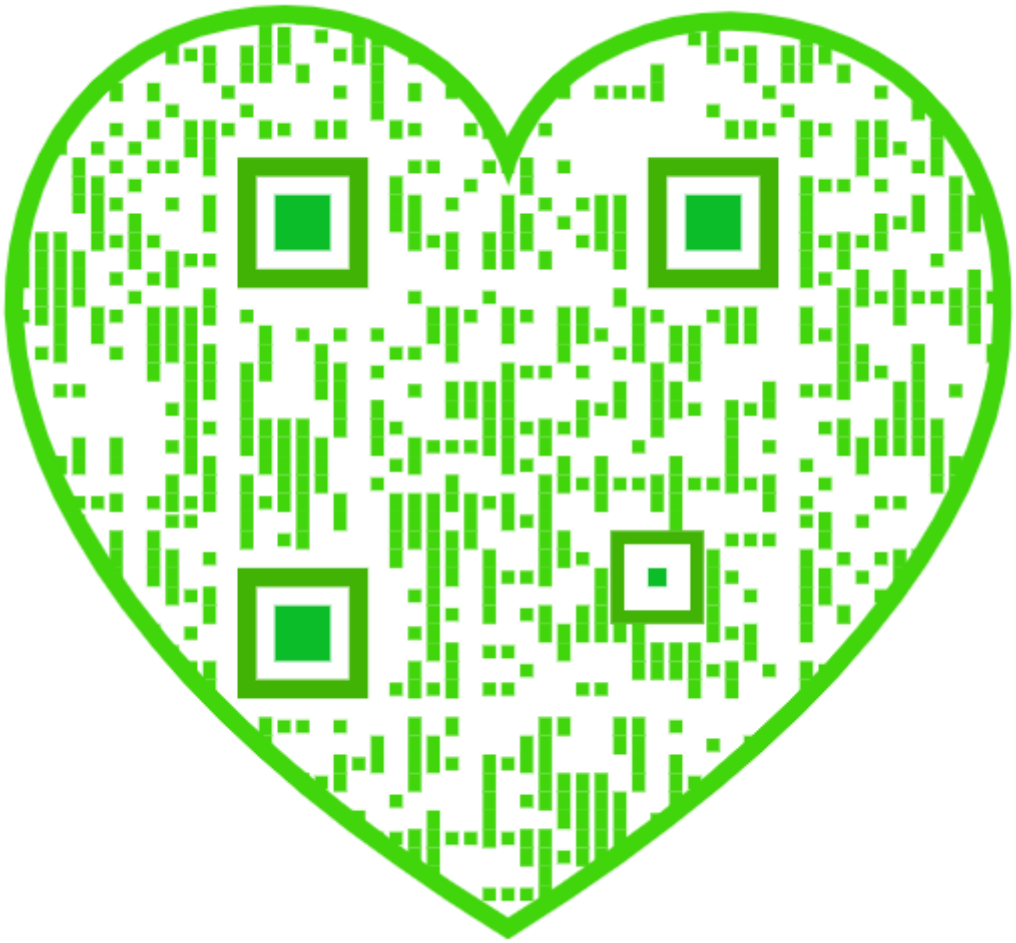

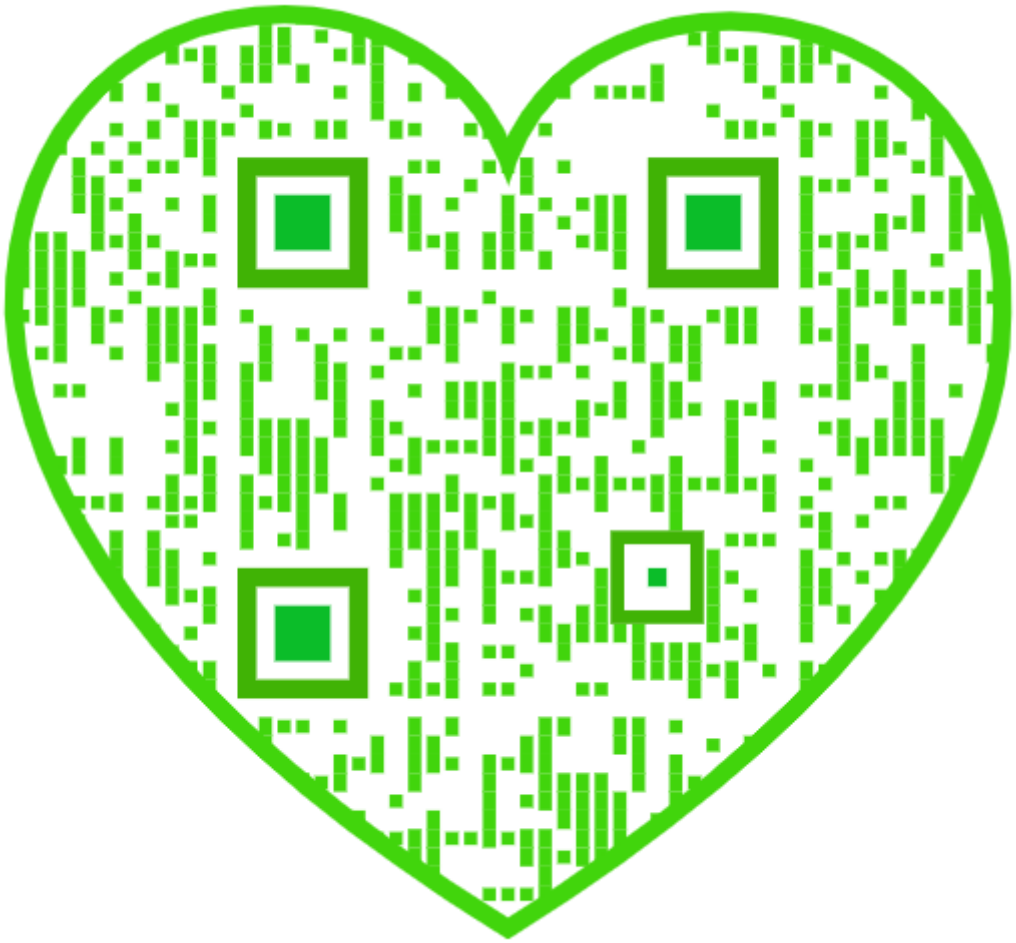

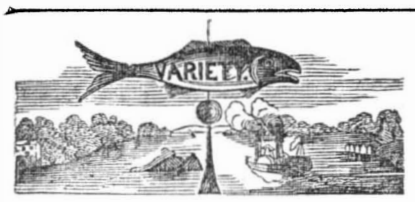

Ingenious Mechanism.

An Albany paper speaks of a squirrel cage, got up for a holiday present, and so constructed that when in operation by the industrious prisoner, it puts in play a fountain, propels a train of railroad cars and other machinery.—In connection with this subject it may be remarked that the squirrel,—especially the red kind,—evinces a peculiar fondness for mechanical motion, and a capacity of timing with music. We once connected a revolving cage with a small hand organ, and were amused to observe that in less than three hours, the little operator kept time accurately with the music of the organ; and so pleased was he with his own performance, after finding the music so completely at his command, that he so wearied himself to exhaustion, that it was found requisite to disstract the machinery to give the squirrel a chance to rest.

The Magnetic Telegraph.

The Atlantic and Mississippi Telegraph is expected to go into successful operation as far as the Ohio river immediately. The line of telegraph from Baltimore to Washington is also about to be extended from the latter city through Georgetown. Alexandria, and Fredericksbugh to Richmond.

Messrs. Livingston & Wells have concluded a contract to extend the telegraphic wires westward from Buffalo to Milwaukie.

The communication between New York and Philadelphia has been resumed, and the line to Boston is expected to be resumed immediately.

Science in France.

A Paris paper says: "The French Minister of Public Instruction has charged the Faculty of Sciences of Paris, to send him a Report on the state of scientific instruction in France. The report is to refer particularly to the manner in which it is to be conducted in the colleges and superior primary schools; it is to declare how far this instruction responds to the wants of society, and to suggest whatever may seem to be wanting."

A Simple Experiment.

Neals' Gazette says. that if a person standing on an insolated block of wood, holds a piece of silver between his teeth, and another person standing on the ground, touches the coin, the first person will experience a sensible shock. It must be understood, of course, that the second person must stand on the earth with bare feet; and even then the shock must depend on an electrical difference of the parties, and will be more sensible with some than with others

A Monstrous Bear.

A white bear of extraordinary size was killed last season on the coast of Greenland, and his skin, being stuffed, is now in the possession of a gentleman in Hallowell, Me.—The length from the nose to the tail is 9 feet. Girth near the fore shoulders 7 feet 3 inches. Height, standing, 4 feet 6 inches. Circumferance of the fore leg 2 feet. He was killed on an island, after a hard fought battle, during which he received six rifle balls. His weight when killed was 2000 lbs.

Barn Burning.

A late number of the New London News reports the distruction of three barns with large quantities of hay and several cattle, by incendiaries, in the eastern part of Connecticut. In one instance, however, the villains had feeling enough to let the cattle out of the barn before setting it on fire. There must be a sad deficiency in their police arrangements if the incendiaries escape detection.

A Long Day.

Doctor Plunket of Cork, once had occasion to restrict one of his rich patients to a pint of wine per day; and on the following day, he encouraged his patient by telling him that if he would persevere in a temperate course, he would thereby lengthen his days. "Indeed I believe you,,' replied the other, "for yesterday was the longest day of my life."

The Boston Times.

We are informed that this popular and long established *penny daily*, has been purchased by Mr. William H. Garfield, a gentlemanly printer, remarkable for industry and enterprise. With the continued aid oft he *original* editor, Roberts, the *Times will flourish.*

Steamboat Mohegan Sunk.

The Mohegan, Captain Manchester, who left this city on Saturday noon, for Bridgeport, struck on the "Gangway Rock," half a mile from Sands Point, and was run ashore to save her from sinking. She lies filled with water to the hurricane deck.

Ship Building.

There were built in the United States, from the 1st of January, 1815, to the 30th June 1845, a period of thirty years and six months, 2,280 ships, 3,235 brigs, 13,145 schooners, 5,404 sloops, 1,727 steamers, 26,794 vessels in all, with an aggregate tonnage of 3,160,000 tons.

Boston weekly Athenæum.

The above is the title of one of our best litterary exchanges and one that we take pleasure in recommending to the public as such. It is published at Boston by Bradbury & Guild at the low price of $2, per annum.

Fall River Railroad.

This road was opened on Monday last, and the trains now run through Middleborough, Bridgwater, North Bridgwater and Randolph, connecting with the Old Colony railroad at South Braintree, Mass.

Dispatch in Building.

The large new mill recently constructed and put in operation in Lowell, and which is one hundred and four feet long, forty-eight feet wide and seven working stories high, was built, furnished with machinery, and put in operation in less than four months.

Bridge across the Ohio.

Mr. Roebling, the architect and engineer who constructed the wire suspension bridge at Pittsburgh, has made a survey of the ground on both sides of the river at Cincinnati, and made a favorable report, which has been published in that city, with a fine lithographic print of the plan and structure of the work.

A Young State.

A bill has been introduced in Congress, for establishing a new Territory beyond Wisconsin, to be christened with the name of Minesota. We may expect to hear of the new Territory, or state of Hittimikik.

Canal Trade.

Upwards of three millions bbls. of flour, nearly three million bushels of wheat, a million and a half bushels of corn, and nearly the same of barley, were received at Albany, during the navigation of the canal the past season.

Importance of Repose.

If a body is cheated of its repose at the proper time by the excitement of pleasure, the moral part of the man—as if in revenge—ceases to watch; and like one walking in his sleep, falls into every sin and snare that lies in his path.

A Consolation.

An exchange considers it a matter of rejoicing that though

"Kittens do increase to cats
Mice can never grow to rats."

Metallic Qualifications.

Somebody says that in order to get on well in the world it is requisite for a man to have gold in his pocket, iron in his hand, silver in his tongue, and brass in his face.

Mr. Clay again in the Field.

At a meeting of the Whigs of Halifax Co., N. C., a few days ago, Henry Clay was nominated as the Whig candidate for the Presidency in 1848.

Cost of Telegraphing.

The publishers of the Albany Evening Journal paid $25 for telegraphing a synopsis of the President's Message from New York to Albany.

Subscription books are open in Cincinnatti for stock in the rail road which is to connect Dayton with that city.

Plank Roads.

Plank roads are becoming popular in the State. One of the most perilous roads we ever had the pleasure of seeing the end of, was that from Syracuse to Fort Brewerton, only two or three years since It is now laid down with planks, and admits of the draught of enormous loads, at a great saving of time, and the wear and tear of teams and vehicles. Its advantage over a railroad, is that farms along its sides are enhanced in value. A similar road from Aurora to Buffalo is talked of.—*Mech. Journal.*

Persecution of the Jews.

80 Jews, headed by the Rabbi, arrived recently at Warsaw to request the Governor to allow them to retain their costume. They were taken to the police, where their beards were shaved off, and their long hair cut, and then sent away. They however received the barber's bill, which they were made to pay.

Benefit of Advertising.

The Southern Standard tells the story of a man in London who determined to spend all he made the first year in advertising; but soon found that it was impossible, for the simple reason that the more he advertised, the more he made; and after strenuous exertions to get clear of his money, he had to give it up.

Preparing Tea.

It is said that tea affords a flavor much richer when steeped in rain water, than in spring or well water, for the reason that ordinary well or spring water is generally impregnated with lime. If so, the lime acts chemically upon the tea leaf and destroys the aroma.

The Right Move.

The Washington Fountain says: a decided disposition is evinced among members of Congress to provide for the purchase by the Government of Mr. Morse's Telegraphic invention, and for the extension of lines between all the principal cities of the Union, to be under the management of the general Post Office.

Bullets.

The St. Louis Union says that there is a machine employed in that city, in making bullets, of which it turns out 180 per minute.—Two millions of balls have been shipped for the seat of war within two weeks.

Probably True.

Somebody says, that a newspaper in a family is equal to three months time in a school. Go into a family where a newspeper is taken, and into those who "cannot afford it," and mark the difference in the intelligence of the children and be convinced.

Temperance in Vermont.

The license law of Vermont was so altered at the last session of the legislature as to provide for submitting to the people of the state at large, the first Tuesday in March next, the question of license or no license.

Shells.

Six hundred and twenty tons of bombshells at the Western railroad depot in Albany, manufactured at Troy, destined for the Gulf of Mexica, are ordered to West Stockbridge, thence by the Housatonic railroad to Bridgeport, where they will be shipped to New-York. They are furnished by Chollar and Jones at 5 cents per lb.

New Mill-Pond.

A new mill-pond covering 80 acres has recently been formed in Cabotville. The power acquired by both dams is estimated to be sufficient to carry from 80,000 to 100,000 spindles.

School Diversion.

A young couple ran away from an academy at Leicester, Mass. last week, went to Stonington, were married, and then jogged home again. We hope they will be punctual to school and not neglect their lessons in future.

What an Invention.

One of our exchanges notices a new forcing pump invented in Winchester, Va, and remarks that "it will throw a stream of water of *considerable* volume, as *high as a house.*"—A great affair truly.

A powder house containing 60 kegs of gunpowder, was last week set on fire and exploded at Providence, R. I.

Graham's Magazine.

The January number of this "unrivalled in popularity" magazine, being the first number of a new volume, equals if not surpasses the high anticipation which has been entertained by the public on the subject. It contains four embellishments,—2 superb, 1 elegant, and one comic,—besides about thirty pages of reading matter. Published at 129 Chesnut st. Philadelphia, and Tribune Buildings, New York.—$3 per annum.

General Le Vega.

This Mexican has shown a solicitude to manifest his sentiments of gratitude for the generous treatment he has received while a prisoner in the United States. He not only published a card at New Orleans prior to his departure, expressing in the fullest terms his sense of obligation to American Citizens, but on his arrival at Havana, he republished his card, thanking the people of New Orleans for their kindness, and acknowledging the generosity of the U. S. Government toward himself and his companions.

Facilities Anticipated.

Lord Palmeston, on a recent occasion, speaking of the progress of the magnetic telegraph, remarked in illustration, that the time might come when the Premier might be questioned in Parliament on some point of Indian policy, and in reply might say to his questioner, "In half an hour I will give you an answer from the Governor General at Calcutta."

Ohio Pumpkins.

John Mitchel of Mill Creek township, Hamilton County, raised during the last season, eighty-two pumkins from one seed, fifty-four of them averaged 20 pounds each.—aggregate about 1500 lbs.

Silver Ores.

A vein of silver ore has been discovered in Dubois county, Indiana, and a company have been formed, who are now erecting a furnace for the purpose of working the mine.

Mills at St. Louis.

There are 14 large flouring mills in St. Louis, which turn out 1500 to 2000 barrels of flour daily, and some of them run six pairs of burrs each,

Good Example.

The trustees of the village of Auburn have authorised a select committee to purchase two hundred cords of wood, and to dispose of it to the destitute, at a price not exceeding its cost.

There appears no reasonable doubt, that the magnetic telegraph will be extended to Cincinnati, via Dayton and Germantown, early next season.

The prize money accruing on the various prizes taken at Tobasco and Tampico amount to $220,000—half of which, $110,000 goes to government.

Judge Krum of the Circuit Court has decided (at St. Louis) that neither negroes nor mulattoes, however free, are *citizens* of the United States!

The Bible has been translated into nearly one hundred and fifty different languages—There are few people who have not heard something of its precepts.

The Pennsylvania volunteers embarked at Pittsburg last week for New Orleans, where steamers will be in readiness to convey them to Tampico.

The commerce of the Mississippi Valley is set down at $200,000,000 annually, and is rapidly increasing.

A new iron steamer is being constructed at Niagara, Canada. The workmen are from Scotland. She is expected to be ready by next July.

It is said that the Texan Senators will urge on Congress a more extensive use of the rifle among the volunteers,

We are informed that a new kind of howitzer to he carried on horse-back, has been introduced in the U. S. Army.

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TO THE DOMESTIC NEEDLE.

Thou burnished, busy bit of steel,
I do but tell thee what I feel,
When of the arts of human weal,
I hail thee queen:
Thy ministers, the loom and wheel
Have always been.

They once enjoyed the fireside gleam
When industry bore sway supreme,
And wives were more than some now seem
In strength and heart:
Of late, enslaved by flood and steam,
They work apart!

But though thy body guard is gone,
And thou art left at home alone,
Thou shalt maintain thy rightful throne,
With work to do,
In spite of patents, be it known,—
And tailors too.

Thou hast a patent right to bless,
Which Yankee wit can ne'er make less:
For better means it cannot "guess,"
With all its crowing,
To cure the curse of nakedness,
Than simple sewing.

In truth it is thy glorious feat
To make creation's work complete:
And could there be a thing more meet
Than that thy power
In woman's hand should have its seat,
And be her dower.

They talk about a bow or quiver,
Hearts wounded by them to a fever,
And vows of love to last forever,—
Such is the riddle,—
But love, I think, must sometimes shiver
Without the needle.

The real darts, I must declare,
Which pierce us from the real fair,
And bind us to them pair and pair,
Are needles threaded,
And plied by those to whom we are,
Or would be, wedded.

I envy not the latest fashion
In which the latest fool may dash on,
And which the tailor makes the cash on,
If but my fate is
To wear a coat the tender passion
Has made me gratis.

What if the fit be not commended,
Nor be the finish extra splendid,
If love with every stitch be blended,
'Twill fit the wearer:
And even if the coat be mended,
'Twill grow the dearer.

Show me the wile that's on the watch
For every little rent or scratch,
And cures it with a timely patch,—
Before you know it,—
She is a woman fit to match
A lord or poet.

Than home no place can more delight her
Her heart is bright, her smile is brighter,
Her heart makes every other lighter
And his the most
Whose greatest joy is to requite her,—
Her pride and boast.

Here I must leave thee, queen of hearts,
To shoot thy polished barbless darts,
And bind the perforated parts
With skill creative;
Of Paradise thy art of arts
Was well a native.

If sin it was that gave thee birth,
No less for that is now thy worth:
Against the fiend thou comest forth,
Its wrong to mend,
To shivering mortals here on earth
The warmest friend.

While love has happiness to make,
Thy crown no man shall ever take,
Thy charm no man shall ever break,
At least, no true man:
Home shall be dearer for thy sake,
And so shall woman.

For the Scientific American.

Mr. Porter.

Thanking you for the insertion of my last week's communication, I avail myself of an half hour's use of your desk to write out the solutions of my twelve problems. I prefer to write in your office rather than in my school room at 183 Canal street, that you may testify that I write from memory alone, or without the aid of any book or manuscript, and my object is to put down on this paper every letter and figure necessary in the solution of these problems.

PROBLEM I.

New York had in 1840, according to the census,	2,428,921
New Jersey,	373,306
Pennsylvania	1,734,033
Delaware	78 085

PROBLEM II.

Maine had in the year 1840,	501,793
New Hampshire	284,574
Vermont	291,948
Massachusetts	737,699
Rhode Island	108,830
Connecticut	309,078
There are in the four middle states more than in the Eastern states,	2,379,523

PROBLEM III.

622-573-514-624.

These figures show that Jan. 1st, 1847, will fall upon the 6th day of the week or Friday. Feb'y. 1, 1847, upon the 2d day, or Monday.

March 1	"	2d	" Monday.
April 1,	"	5th	" Thursday.
May 1,	"	7th	" Saturday.
June 1,	"	3d	" Tuesday.
July 1,	"	5th	" Thursday.
August 1,	"	1st	" Sunday.
September 1,	"	4th	" Wednesday
October 1,	"	6th	" Friday.
November 1,	"	2d	" Monday.
December 1,	"	4th	" Wednesday

PROBLEM IV.

377426415375.

These figures show that the first Sunday of the several months of 1847, in order, will fall on the 3d, 7th, 7th, 4th, 2d, 6th, 4th, 1st, 5th, 3d, 7th, 5th of the months.

It will be seen that the last figures the 8th) are made by subtracting the figures in the 3d solution from 999 &c., thus: 9—6= 3, 9—2=7, &c.

PROBLEM V.

The solution of this problem would occupy too much room for this week's paper. I will prepare it for our future number.

PROBLEM VI.

The square of 999999 is 999998000001.

The square of one 9 is 81; one 8 and one 1.

The square of two 9's or 99 is 9801; one 9 one 8, one 0 and one 1.

The square of three 9's or 999 is 998001; two nines, one eight, two noughts and one 1.

The square of four 9's or 9 999 is 99980001; three nines, one eight, three noughts and one 1.

The square of five 9's or 99999 is 9999800 01; four nines, one eight, four noughts, and one 1.

Whence the method of squaring any sum consisting of nines is evident.

[When Zerah Colburn was asked to give the square of 999999, he at first said he could not do it; but after much study he said at length that he had discovered the method, viz. multiplying the square of 37037 by the square of 27. This will undoubtedly solve the problem, but it is an exceedingly awkward and tedious process.]

PROBLEM VII.

The decimal quotient of 1-89 is	.0182
	35955056
	17977528
	08988764
	04494382
	02247191

This problem is performed by multiplication thus: set down the last figure of the circulate 1 and multiply it by 9, saying 9 times 1 is 9, which put down at the left hand of the 1; then 9 times 9 is 81, put down 1 and carry 8; 9 times 1 is 9 and 8 to carry is 17; put down 7 and carry 1; 9 times 7 is 63 and 1 is 64, put down 4 and carry 6; 9 times 4 is 36 and 6 is 42, put down 2 and carry 4: 9 times 2 is 18 and 4 is 22, put down 2 and carry 2; 9 times 2 is 18 and 2 is 20, put down 0. Then multiply this by 2, putting down the product above, and so continue until the figures, &c. in the first line recur again.

PROBLEM VIII.

This problem may be solved by division many ways. The following is as easy as any. After obtaining the first or bottom line as above, divide that line by 2, which will give the first eight figures of the circulate; then divide these first eight figures by 2, and so continue dividing by 2, until the first figures recur, when the work is done; thus

2)02247191

.01123595
50561797
75280898
87640449
43820224
7191011, &c.

PROBLEM IX.

This problem is performed by addition thus: Divide in the ordinary way 1 by 89 until .01 the two first decimal figures are obtained; then add every two successive figures together and put down the sum: thus 0 and 1 is 1, which set down; 1 and 1 is 2, which set down, 1 and 2 is 3, which set down; 3 and 5 is 8 and 1 is 9, which set down [here observe that 1 must be added whenever the next following figure is so large as to make the sum more than 10.] Proceed thus until the whole circulate is complete.

PROBLEM X.

This problem is performed by subtraction thus: Begin at the last figures and say 1 from 10 leaves 9, which set down; carry 1 to 1 makes 2, which subtracted from 9 leaves 7, which set down; 7 from 11 leaves 4, which set down; and so continue through the circulate.

In this manner all these problems can be performed as fast as the figures can be written down.

PROBLEM XI.

(Fully answered but omitted for want of room and interest.).

PROBLEM XII.

According to the most approved chronology:
The creation took place 4004 B. C.
The death of Abel 3875 at the age of 127
The death of Adam 3074, at the age of 930.
The translation of Enoch, at the age of 365.
The flood took place place 2348.

The birth of Abraham 1996: his call to go into a distant land 1921; his offering up of Isaac 1871; his death 1821, at the age of 175.

The birth of Moses 1571; his escape into Egypt 1541; his entry into the desert 1491; his death 1451, at the age of 120.

The killing of Sisera by Jael, 1285.

The dedication of Solomon's temple, 1004.

The birth of Cyrus, 599; his decree in favor of the Jews, 536.

The birth of Christ, 4 years before the common reckoning.

The crucifixion. 33 years after the common Christian era.

The destruction of Jerusalem, 79.

T. CLOWES.

Note.—Dr. Clowes gave the above answers in a few minutes, showing an extraordinary memory as well as mathematical ability. The dates given in the 12th problem are according to Usher's chronology, which is now discarded as erroneous.

WESTFORD, N. Y., Dec. 12, 1846.

Mr. Porter:

DEAR SIR:—I discover on perusing the Scientific American that you are sometimes consulted on subjects of a scientific nature, and return answers through the paper. I would therefore beg to intrude upon your patience for a few moments.

I have for sometime past been engaged in making experiments upon a waterwheel to be attached to a horizontal shaft; the wheel for ordinary purposes to be about 4 feet in diameter to be driven by the water acting upon the same by its gravity. I therefore take this method of consulting you as to the propriety of making an application for a patent for the same. The following is a description of the wheel.

My wheel consists of a drum cylinder attached to a shaft which in general should be vertical; to said drum is attached an upper and lower rim projecting outwards far enough to receive 2 buckets or floats between them, which are hinged to the periphery of the drum so that they may open on one side to receive the action of the water and close on the opposite side into recesses prepared for that purpose in the periphery of the drum in such a manner as to leave an even surface to the same when the buckets are closed, they being a little curved for that purpose. The wheel is made to revolve within a curb which encircles half its circumferance in order to confine the water to the wheel.

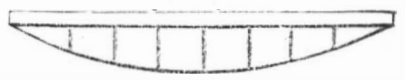
The water is made to enter the wheel through a square spout or trunk in the direction of a tangent with its circumferance. The plank comprising the side of the trunk next to the drum is made of sufficient length to reach the periphery of the same, and of sufficient width to fill up the space between the rim to prevent the escape of the water in that direction, the thickness of the plank being increased at that point to prevent its bending by the pressure of the water and crowding the drum. The wheel is open on on the backside from the trunk to the termination of the curb to vent the water from the wheel. The axis on which the buckets turn is made to project through the upper rim, to which is attached levers at right angles with the buckets so that when the buckets are closed the levers project towards the shaft. At the point where it is desirable to bring the buckets into action, the levers come in contact with a stationary cleet attached to a fixed object above the wheel, by which a partial opening is affected the *water* forcing the buckets open as soon as it is brought to act on the backside thereof; the buckets on the opposite side close as soon as released from the pressure of the water after passing the termination of the curb aforesaid.

Please notice briefly in your paper as soon as practicable whether the whole or any part of the above described wheel has been patented, if so state the particular part claimed and oblige, Yours with respect

Rufus Porter Esq. GEORGE GUY, JR.

Remarks.—The water-wheel above described is on a very ingenious plan, and has sufficient novelty to entitle it to a well founded patent. The only objectionable points are, 1st the difficulty of changing the position of the buckets quick enough for a rapid motion of the wheel, and 2nd, the excessive lateral pressure of the water on one side of the wheel, which will cause considerable wear in the bottom gudgeon and box. But both of these difficulties may be easily avoided and the invention may be made to succeed well, especially if the wheel be furnished with three buckets instead of two. We should advise the inventor to go ahead. ED.

Inverted arch suspension Bridge.



A Correspondent informs us that the bridge over the Ayer near Catrin, Scotland is constructed on this plan. The span is 200 feet, and the chord is supported by cast metal posts that rest on a curved wrought iron brace which extends from end to end, as represented in the cut. This principle has been frequently used in this country for supporting large roofs and floors, and long freight cars for railroads

Stellar Distances.

We may form some definite idea of Stellar Distances, says Prof. Mitchell of Cincinnati, sketches of whose recent lectures on Astronomy we have read with the greatest pleasure in the Herald of that city, if we keep in mind the fact that light, which moves at the rate of 12 millions of miles per minute, only requires about four hours to reach our earth from Le Verrier, while to come to us from the star 61 Cygni, it would take 10 years! And we may arrive at a still greater degree of certainty in our estimates of these distances, when we take into consideration Maedler's discovery, that the centre of the universe of stars to which our sun belongs is among the Pleiades, whence it takes light 561 years to reach our globe, and about which our sun performs a circuit that requires one hundred and eighty-two millions of years to complete!

An Excuse.

"Can you pay this small bill to-day?" says a collecter. "Call to-morrow, will you, I have a duel to fight in half an hour, and have not got the time to look over your account just now."

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NEW INVENTIONS.

The following are the claims of inventors to new inventions recently patented, but of which we can give no description.

BY LIVINGSTON, ROGGEN ADAMS & CO.

Dec. 10, 1846

Improvement in attaching Door Knobs to their collars.

What we claim is the mode of combining a metallic neck and collar with a glass head by means of wire loops, or metallic projections, united with the collar and extending into a glass head, while the glass is in a fused state.

—

BY WILLIAM HIGGS

Dec. 10, 1846

Improvement in casting door knobs upon their collars.

What I claim is the mode of producing the entire hollow knob in casting, through the use of the dovetailed neck. The sand core and tube connected, and the placing of these in conjunction, for the reception of the metal in casting the knob. I also claim the combination of the metal tube with the sand core, and the dovetailing of the neck for the purpose above stated.

—

BY WILLIAM M'CAMMON

Dec. 12, 1846.

Improvement in brakes for car wheels.

What I claim is the constructing of self-acting and self-retaining, anti-collision brake for railroad cars, by means of the combination of the bumper, spring, brake shaft ratchet and pull with each other, and with the rubbers.

—

BY OWEN TRACY.

Dec. 12, 1846.

Improvement in axles for carriages.

I claim the additional pipe box, in combination with the crank of the axle, and either with or without the brace, the whole being arranged for the purpose specified.

—

BY SAMUEL B. HOWE.

Improvement in Churns.

What I claim is the construction of a churn having a rotary dasher which when in motion draws the milk and cream in at its end and expells it at its periphery against stationary breakers fixed at the inner circumferance of the tube in which it revolves.

—

BY GEORGE H. THATCHER.

Dec. 12, 1846.

Improvement in setting tires upon wheels.

What I claim is the mode or manner of setting tire around fellies or wheels, by the application of a jointed band in the manner which I have described, for the purpose of tightening the fellies or spokes and setting the tire by means of the compression caused by drawing the ends of such flexible bands toward each other by the lever and catch or by the nut and screw or other means substantially the same, such as by a wedge or key, and overlaping the ends and securing the tire by bolts held by nuts or rivited, or by other means substantially the same.

—

BY E. D. WILSON.

Oct. 15, 1846.

Improvement in Washing Machine.

What I claim as my own invention and desire to secure by letters patent is constructing the washing machine with a swinging concave of rollers, upon which the clothes to be washed are placed in combinatian with a swinging box, open at top and bottom for holding the clothes in contact with the rollers and moving them back and forth over the same, having a corresponding follower placed therein moved simultaneous with said concave of rollers by means of a triple crank, and connecting rods, the concave of rollers moving in one direction; whilst the box with the follower and clothes therein moves in a contrary direction by which a double action is produced as set forth.

—

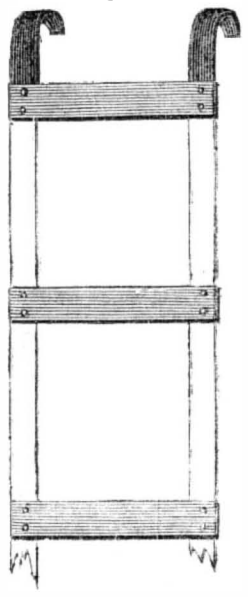
BY W. H. ROBERTSON.

Dec 17, 1846.

Improvement in Matrasses.

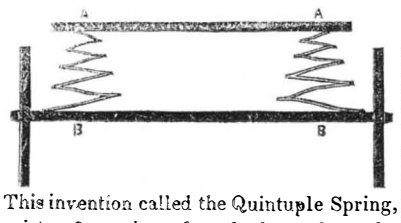
What I claim as my invention, and desire to secure by Letters Patent, is,—first making mattrasses by confining within a ticking or tickings, made of any materials, layers of glazed cotton batting, or unglazed batting with glazed paper or cloth interposed, substantially as described, to prevent the fibres of the different battings, and those of each batting from matting together as described. And second—confining the compressed cotton between two cloths connected together by means of a cord or cords, when this is combined with a ticking or outer covering, substantially as above described, whereby the cotton may be retained by the cords and cloths, in a state sufficiently compressed to admit of its being easily introduced in the ticking, or removed therefrom as described.

Escape Ladder.



It frequently happens when fires occur in the tall buildings of cities, that the egress of the inmates by the stairway, is prevented by the flames and smoke; and in several instances of recent occurrence, several persons have been compelled to escape to the roof, or leap from the windows before the fireman's ladders could be brought to their relief. On this account many of the lodgers in the principal hotels, especially those who are not accustomed to five story houses, suffer constant apprehensions, which prevent the quiet rest which nature requires. To remedy this evil, a plan is here introduced for a ladder so compact and portable that every traveller may carry one in his trunk or valise, without inconvenience.—It consists of two leather straps placed parallel about ten inches apart, and connected by cross-bars of wood at equal distances, ten or twelve inches apart, firmly secured to the straps, and of sufficient strength to sustain the weight of one or more persons. The cross bars are an inch and a half wide and half an inch thick, and have a slot in each end thro' which the strap passes, and the cross bar is secured to the straps by rivets. Two flat iron hooks are attached to one end of the straps, for the purpose of taking hold of the inside of a window seat, by which they are held secure, while the escaping parties descend. A ladder of this description thirty feet long may be rolled up to a very small compass and may be afforded for a trifling expense, compared with its utility, in at least giving confidence and a feeling of security to those who sleep in third stories and upward. It will be understood that only a small section of the ladder is shown in the cut. If this notice induces a demand for the article, we can procure and furnish them for 25 cents per foot.

Improved Carriage Springs.



This invention called the Quintuple Spring, consists of a series of steel plates about the size of those of ordinary eliptic springs, but of different lengths, and firmly connected at the ends thereof, as represented in the cut.—It has been ascertained by experiment that springs of this construction will sustain three times as much pressure in proportion to the weight and cost of the springs, as the common eliptic or feather springs. One important peculiarity and advantage in these springs, consists in the gradation of the different length of plates, whereby they play freely elastic, when sustaining a light load, while the shorter plates resist the pressure of the heaviest loads required to be supported. They may be arranged parallel to the axle, as shown in the cut, or on side bars and in the direction of the track. They are for some purposes graduated differently, having the short plates at the top and bottom, with the longer plates in the centre. These springs have been invented and put into practical use by Mr. Eben'r. Snow Jr. of East Haddon, Ct., who intends to apply for a patent immediately.

On the Manufacture of Steel.

BY DR. CARL SCHAFHAEUTL.

Iron, in the composition of which a portion of silica is replacen by manganese, will, while being smelted, rather part with the latter than the former. From this it follows that at the moment when the iron is on the point of passing from a liquid to a solid state it will retain sufficient silica to form steel. For this reason during the whole process of refining the current of air is caused to act rather upon the surface of the metal than through the interior of the fluid mass, in order to avoid the combustion of too much carbon and silica; from which it follows that the casting becomes malleable without losing a sufficient quantity of silica to constitute iron, properly so called, and the product is raw or blistered steel. The casting which does not contain any maganese, loses, by the effect of combustion, a portion of silica proportionable to the quantity of carbon burnt and furnishes iron only as a definitive product.

It is simply to the mechanical action of the hammer that the distinctive features of steel as compared with cast metal, are due. In order to effect this change, the blistered steel is broken into pieces and melted down, they are afterwards tempered—again broken into pieces. and welded together at a good welding heat. The steel will be more malleable, and possess more tenacity and uniformity of texture, in proportion to the number of times these operations are repeated The product is called "wrought or shear steel."

STEEL OF CEMENTATION OR CAST STEEL.

When bar-iron is heated to a white heat, or even melted in close vessels containing coal or carbonaceous substances, it takes up a certain quantity of carbon, and is transformed into castings of various kinds.

If the iron contains, together with silica, phosphorus and arsenic in proportions suitable for softening the granular particles of iron during their combination with the carbon, by keeping it for a certain time at a red heat, with powdered charcoal, a casting is obtained which when submitted to the action of the hammer, or of rollers, furnishes a product known as "steel of cementation." During this operation, the stratum of oxide which covers the particles of iron inside loses its oxygen, and passes again into a metallic state, but the vacant spaces occasioned by this are filled up, as the ferruginous particles, which are in a semi-fluid state, re-assume the chrystalline form. The carbonic oxide gas in escaping forms large blisters on the surface of the metal under which the softened mass chrystalizes.—On being broken the interior of these blisters instead of appearing of a dark color, indicating the presence of a stratum of protoxide, presents a brilliant and rainbow tinted appearance the yellowish and bluish tints distinguishing bronzed steel being observable. If this steel be wrought at a white heat, these blisters will weld in with the mass with the greatest facility. During cementation, the carbon combines with the component particles of the iron in various proportions, depending in a great degree upon the chemical composition of those particles. It is, therefore a vulgar error to suppose that steel of cementation contains more carbon at the surface than in the interior, as stated in all technological treatises. Thus, in the best Dennemora steel, it very frequently happens when the cementation is finished that the centre of the metal contains a much greater quantity of carbon than the superficial portions. It may also happen that steel produced from the best Dannemora bar-iron will differ in an extraordinary manner as regards hardness, in various portions of the bar, and for this reason, in steel works in England, the bars of steel are always broken into several pieces, in order to class those pieces together which are most similar in quality.

If ordinary iron be submitted to cementation that is to say, iron in which the proportion of silica is ordinarily insignificant, when compared with that of carbon, and that independently of this the iron is deficient in the quantity of phosphorous and arsenic necessary for easily softening the metallic molecules, only carburet of iron and a little silicuret of iron are produced, but the carbon does not combine with the silica. In this case the steel obtained is deficient in malleability and tenacity,—for this reason, the molecules will not unite or chrystalize until they have taken up a quantity of carbon more than sufficient to produce steel. With regard to simple carburetted iron (when it contains more carbon) it either will not harden at all when tempered or becomes friable and brittle when heated to redness, even when it does not contain more carbon than steel of good quality.

The fracture of the steel of cementation now under notice is grey and dull, while steel of good quality is of a silvery aspect, and presents cubical chrystals.

The best steel can only be obtained by the cementation of forged iron. Whilst the metal is combining with the carbon the iron must not enter into a complete state of fusion as in that case groups of chrystals, each possessing a different degree of carbonization would be formed, even the best Dannemora iron will not furnish a uniform product fit for commerce when melted with substances containing carbon. I am well aware that the experiments of Clouet, Aachette aud Breant may be opposed to me as set forth in various treatises upon chemistry, but these are unfortunately mere laboratory experiments the authors of which have prudently concealed, or passed over in silence all those which were unsuccessful. When the operator has abtained a regulus at the bottom of his crucible and when after immense trouble he has succeeded in extracting from it a small portion of steel capable of being worked he immediately hastens to publish his pretended discovery in some journal of which others become faithful and credulous echoes, thus the manufacture of steel has become the subject of chemical inquiry, complaints are daily becoming more frequent upon the difficulty of procuring steel capable of resisting the treatment to which it is subjected in the arts. If the persons who preside over the coining department either in London or Munich were consulted they would all agree in saying that it is now very difficult to meet with the quality of steel necessary for making dies. Even in England good steel becomes more and more scarce. With regard to the manufactories of cemented or cast steel established upon the continent they furnish products the quality of which is so uncertain that the workman is often reduced, after having lost his time and trouble, to throw away certain portions as they want the necessary uniformity and tenacity.

All the artificial alloys of steel with silver, of which so much has been said, are not fit for anything, and are never met with in commerce.

When the steel has been withdrawn from the cementing furnace and after it has been broken and the pieces drawn out, they are submitted to one of the following operations:—the pieces after being welded together, (this is called fogotting steel) or the sorted pieces are placed in clay crucibles of a nearly cylindrical form and cast in a reverberatory furnace in which two crucibles are placed one behind the other upon cakes of fire clay, the orifice of these crucibles is closed by a flat cake of fire-clay. The bars of cemented steel as above mentioned are divided into pieces of one or two inches in length, these pieces are distributed according to their degree of carbonization in vessels fixed to the walls of the place in which the melting is carried on.

These different qualities of steel are generally combined in such a manner as to obtain a product the best suited for the purposes to which cast steel is ordinarily applied.

[*To be continued.*]

A Hint for Bankers.

A swindler in London having obtained the check of a merchant for eight pounds, presented it at the bank and obtained eighty pounds for it, without further trouble than the simple addition of the letter *y* to the word and a cypher to the figure.

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NEW YORK, JANUARY 2, 1847.

Compliments of the Season.

Respected Patrons :—We shall not on this occasion content ourselves with the very customary expression of the very limited wishes for your enjoyment of prosperity and happiness for a single year : but our earnest desire is, that you will one and all, even before this paragraph meets your eye, be favored with the full and perfect possession of not only abundance of all the good things which this world can afford, or the heart of man desire, but of inexpressible and inconceiveable extacy of sublime joy, on the most immutable foundation, surrounded with multitudes of the most excellent, sincere, beautiful intelligent and affectionate friends,—with abundance of riches, honors, and safety, in the most richly perfumed atmosphere of fields of living splendor, with melodious music and brilliant beauty, permanently established for as many centuries as there are drops of water in the ocean, multiplied by the sands of the sea shore and of the earth. And this, good friends, is not necessarily a vain or idle flight of mere imagination, but may, for ought we can possibly know, become a bona fide reality, before this paper conveys to your minds, this expression of our sentiments on this anniversary of good wishes.

The War.

We are no advocates of war, it is well known : but it now appears to be the prevailing sentiment throughout the country, and especially among those who are the best acquainted with the general character of the Mexicans, that the only way to secure an honorable peace, is by a vigorous prosecution of the war. The influence of those very consciencious writers who studiously exaggerate the evils and injustice of the war, and withhold from their readers a large portion of that they know to be facts, are more likely to prolong the war than to bring it to an early termination. If it were possible to influence our President and Members of Congress, in favor of peace, without producing at the same time an adverse influence in Mexico, there would be more propriety in publishing one sided arguments against the war principles and movements. But it is not so. The most influential Mexicans are well informed concerning the prevalence of sentiments in opposition to the war in some sections of the United States : and should our government now withdraw our troops, or relax its military operations and manifest a solicitude for peace, the best terms that we could expect would be to relinquish a considerable portion of Texas, and indemnify Mexico for the expenses of the war. Would any American citizen consent to such terms? Yes ; there are some who would go further, and relinquish not only all Texas, but a part of Louisiana with it : though we admit that such people cannot be strictly considered American citizens. That Americans should do *right* in the premises all are ready to admit : but the main question is, what is right? No person of tolerable intelligence, will deny that the inhabitants of Mexico are generally in a wretched state of ignorance, bigotry, vice and degradatien. The introduction of American liberal principles among them cannot fail to enlighten, improve and greatly benefit them. Many of the most intelligent Mexicans are aware of this, and readily admit it, and the most zealous peace advocate among us, cannot deny it. We have been cautious to say nothing in favor of this war, and have regretted many of its incidents : but we have hoped, and still hope, that in its results it will under Providence be salutary : and instead of extending the American system of slavery, as many appear to apprehend, it will open large fields for the advancement of education and science, the introduction of the sacred Scriptures, and lead eventually to the advancement and restoration of the first principles expressed in our Washingtonian and Jeffersonian constitution, that "all men are born free and equal:" and finally result in "the greatest good to the greatest number."

TO CORRESPONDENTS.

"W. B. of S. S."—You are probably aware that a compact and portable file-cutting machine has been patented within the year past in the United States and in England. We have not seen the machine, though we have conversed with the patentee on the subject.—Yours may supersede that however, but we must see a drawing of the machine before we can do anything to aid its introduction &c.—Show us the construction and mode of operation, and if it appears favorable, there will be no want of the means of introducing it.

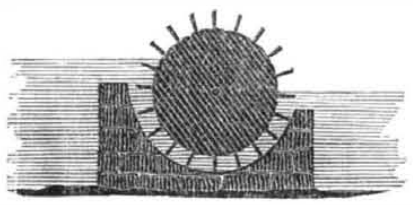
"D. T. of N."—The machines used in turning rake-handles, pitch-fork handles, &c. consists of a lathe, to the bars of which is fitted a sliding head, which moves with a steady motion from one end of the lathe to the other ; and to this travelling head is attached three cutters of different sizes, the first of which takes off the corners of the timber, (which is first sawed into squares of convenient size, and adjusted on the centres of the lathe,) the second cutter reduces the stick to the required size, either of uniform diameter, or tapering from end to end, or swelled in the middle as the case requires ; the motion of the sliding head being governed by the direction of a groove made for that purpose in the top of the lathe bars, or a strip of plank thereto attached. The third cutter has a delicate edge, and finishes the work by smoothing it. But the best machine for turning, or rather rounding broom handles, banisters, &c. consists simply of a short hollow shaft, three inches long, with a bearing at or near each end, and a pulley between the bearings. One end of this tubular shaft is bell-shaped, and has an oblique slot cut therein, to which the cutter, like the cutter of a joiner's plane, is attached by set-screws. This cutter is set with its edge inward, and the edge being a little curved from the centre in front, it reduces to a smooth and uniform roundness, every square or irregularly shaped stick that is passed through it longitudinally when in quick motion. We have constructed and used machines of this kind for the rounding of trunnels and various other articles, and they are most convenient for making broom handles and lead pencils.

"A M. C. of B."—The power of a re-action steam engine, is not derived from the atmospheric resistance againt the escaping steam but the inertia of the steam in escaping reacts on the tubes or periphery of the wheel from which it escapes : and the wheel would run nearly as powerful in vacuum as in the air ; therefore additional density of air cannot add much to is power ; but should a small re-acting steam-wheel be immmersed some inches deep in oil of equal temperature, it would increase its power.

In answer to your second question we would say that the "average leverage of a steam engine crank," or rather the average force applied thereto, is about two-thirds of the force of the piston ; or equal to what it would be if the whole force of the piston was constantly applied to the periphery of a wheel whose radius was equal to two-thirds of the length of the crank.

"C. C. C. S."—We highly commend the course you have adopted of intellectual exercise on the subject of mechanical improvement, and have no doubt that with perseverance you will eventually succeed in introducing something that will both reward your exertions and contribute to the benefit of the community and prosperity of the country. But we cannot readily see the practicability of the plan last submitted by you. Though it is plain that your connections of the central horizontal beam projecting in front of the locomotive, will produce the lateral vibrations required, yet its force could not remove cattle or other obstacles from the track without throwing off the forward wheels : and even in ordinary motion, the momentum of its vibrations would prevent the wheels from running steadily on the track. Try again.

"M. K. of W."—Your plan of a water-wheel would indeed move with a little power, even under the circumstances represented ; but you labor under an erroneous idea if you suppose it would give any more power, than it would do if the water was only one foot deep. The semicircular curve is of no use, as the water would apply the same force to the one or two floats at the bottom of the wheel with a short apron curve, that it does to the whole as represented. There is no advantage gained by having six feet depth of water pressing against one side of the wheel, while it is counteracted by the pressure of five feet on the other side



"J. A. W. of E. Boston.—We know of no such sawmill in operation, and the process of obtaining the information you require, would occupy half a day or more, which we cannot afford to devote to that subject unless you remit one dollar at least in advance.

"Subscriber," Hingham.—You are right in esteeming the common centrifugal blower, as a nuisance. The blowing wheel alluded to, as described in the "Mechanic," did work well, but was expensive, and has been superseded. We have an operating model at this office ; it has not the least similarity to the rotary blower exhibited at the fair ; the latter requiring six times the space of the former.—The quadruple parallel wheel, described in No. 3 of this paper, and which is calculated for either s steam engine, water wheel, pump or *blowing wheel*, is far preferable to either, as it requires to be only two feet in diameter, 1 foot thick, and will blow a strong arbitrary blast with only 100 revolutions per minute.—But we have just procured a new engraving of a complete rotary bellows, the full size of which may be four feet in diameter ond two feet long (or thick) and capable of containing twenty cubic feet of air, the whole of which is discharged twice at each revolution. (The rotary blower discharges only six cubic feet at each revolution.) We shall most likely insert this engraving with full description in our next number. This machine is best adapted to iron furnaces, but the parallel rotary is best for large steam engines. We shall furnish either on reasonable notice, at about $50 each.

"D. D. D. of M."—The answer to your question has cost us much trouble, as we could not readily command the information. With regard to the charcoal bushel the mode of measuring is so various that it is of little consequence what *standard* of bushel is used — We find there is considerable difference in the bushel, by the standard of the different states ; but that of the United States contains 2212 cubic inches.

"E. B. of J." has our thanks for his communication, of another method (with a diagram) of ascertaining the bevels for mill hoppers &c. But we have published two methodsi already, and the expense of procuring illustrative engravings is so high, that we doubt whether its insertion is expedient at present. We shall take time to consider.

"S. S. of E. M."—There is no necessity for your visiting our office personally, if you can send us rough drawings and description as will enable us to understand the construction of your invention. We can procure a model and furnish the drawing and specifications &c. and send the papers to you by mail for your signature, and then having them returned to us, forward them all to the Patent Office, and send you the letters patent when issued. The entire expense seldom exceeds $25, besides the model and patent-fee of $30. We have furnished the writings and drawings of some inventions, charging five dollars only.

"F. R. W. of N. C."—The nails to be swedged as described in No. 13 do not require to be heated, nor are they bent or sprung in the operation. The different sizes from 6d to 10d may be swedged by the same machine.—The operation is performed by a single motion of the foot.

"R. S. L. of Enon."—The bell crank to which you refer, not having the least resemblance or similarity to that of your invention, it is supposed that a description and drawing thereof would not be of any utility to you;—Your improved crank embraces a new and curious mechanical movement, and we shall be pleased to give its description with engravings, whenever it may suit your convenience.

"C. A. of S."—We prefer this mode of answering your communication, and presume it will be equally satisfactory to you. We have never discovered any reason to believe that any arrangement of mechanism can be made to move with a continuous motion, independently of the motion of the earth or of the elements thereof. In answer to your second question we would say, that if you submit to us a well defined plan of any arrangement for that purpose, we will procure an experiment on terms more favorable to you than your own proposition, unless we can show good reasons why it will not succeed.

"R. S. T. of C. (S. C.)"—With thanks for your good intentions, we must say that you have greatly overrated our abilities in supposing that we could see either feasibility or utility in your projected plan for working types by the electro telegraph. If the types are to be set up or arranged in form by hand, we need not depend on the telegraph to take an impression therefrom.

"A. Y. of M."—Your first communication must have been missent, mislaid, or misunderstood. With regard to the atmospheric railway, we have, ever since their introduction, entertained the opinion, that when the projectors had expended a sufficient amount of capital (for their own satisfaction) in forcing them into use, they would be abandoned altogether, as not able to compete with locomotives. The prevalence of similar sentiments have probably prevented the introduction of this kind of railroads in this country. With regard to the advantages of which you enquire we have not been able to discover them.

"E. G. of P."—An engraving of your water wheel is in progress, but may not be finished in season for this paper. We can only give a single perspective view, however, with full explanations.

"M" of Providence should be reminded that the article of which he complains was neither editorial or selected ; hut a paid advertisement. However, the invention referred to *does* embrace a new principle, as we have explained in a former number.

The Columbian Magazine

Published mouthly by Israel Post, 140 Nassau st., at $3 per annum, The January number has been issued and is, perhaps a *leetle* ahead of any thing before offered. Among the embellishments are two of Sadd's best mezzotints—the "storming of Palace Hill at the battle of Monterey" and "Harry Birch and the Skinners"—either of which are worth 50 cents—besides an elegant fashion plate, and a piece of choice music, the "Vesper Bell."—Enough said.

Ohio Temperance Artizan.

We have received the first number of a new paper under the above title, published at Cleaveland, Ohio, by Pinkham and Coggshall, and from this specimen we think it will prove a first rate newspaper, as well as the staunch advocate of the temperance cause. We hope it will be extensively patronized.

To New Subscribers.

Those subscribing to the Scientific American will be furnished, if desired, with all the back numbers of the present volume. Bound together at the end of the year, they will form a handsome and valuable work.

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CHEMISTRY.

Continued from No. 14.

NITRIC ACID, OR AQUAFORTIS.

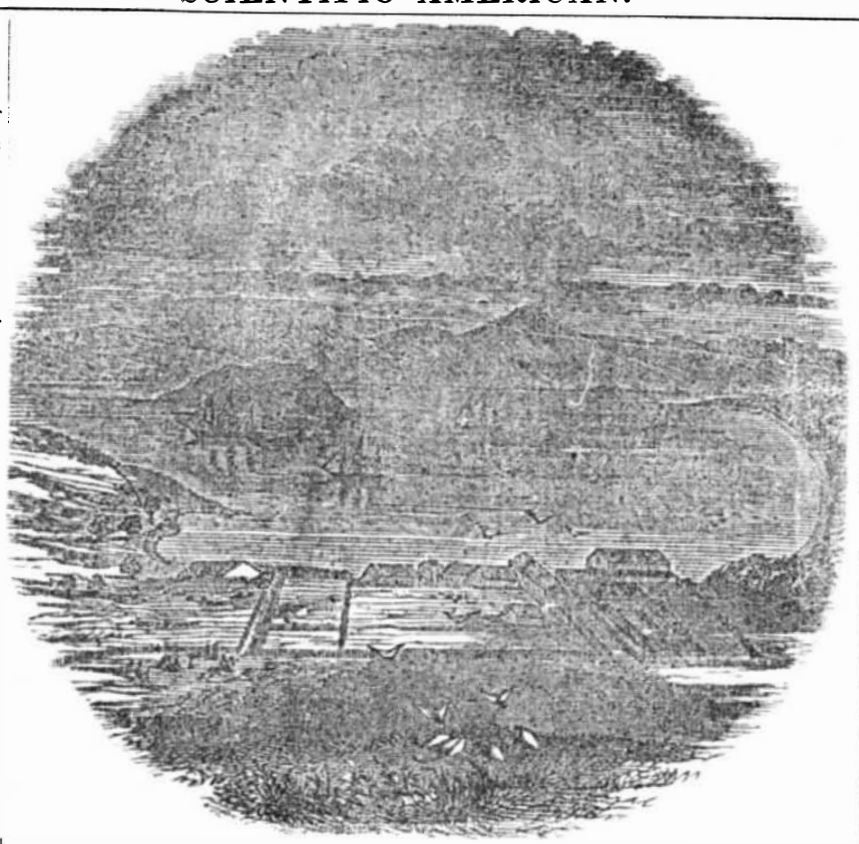
This virulent substance is a compound of one volume azotic, and two and a half volumes of oxygen gas. Common nitric acid is of an orange color on account of its containing a little muriatic acid as also a little sulphuric acid and water. Light has likewise an effect upon it. The specific gravity of the strongest procurable nitric acid is 1.55, and then it contains one-seventh of its weight of water.; that of commerce is about 1.423, end contains two-fifths of its weight of water. Nitric acid has very remarkable effects upon water with regard to the production of heat. If diluted with half its weight of water, heat is evolved, but if the water be in a state of snow intense cold is the result. Hence, this compound is employed to produce great degrees of cold. If nitric acid highly concentrated be thrown upon phosphorus, charcoal or oil of turpentine it inflames them. It is very extensively used in the arts and forms a numerous and important class of salts, having the generic name of *Nitrates*, such as nitrate of silver, nitrate of potash, &c. Some of these we shall notice afterwards. *Nitrous acid* is a compound of the same kind, but of lesser quantity of oxygen.—Amongst the other compounds of azote and oxygen, that entitled the *protoxide of azote* or, as it was formerly called, *nitrous oxide*, is the most remarkable. Davy discovered that we may breathe it for a short while without any effect being produced, except an exhiliration of the mind. Combustibles burn in it more brilliantly than in comman air. There is also a *deutoxide of azote* and a *hyponitrous acid*; but these do not require minute detail. Azote combines likewise with clorine and bromine. Nitric acid can be procured by filling a glass retort about one-third full of equal weights of aqueous sulphuric acid and common nitre. The retort is then subjected to heat, and a vapor is distilled over, which, condensed, is nitric acid.

AMMONIA, OR HARTSHORN.

This important substance is formed by the combination of azote with hydrogen, and is obtained in the state of gas, by means of a salt called *sal ammoniae*, which is a compound of muriatic acid and ammonia. This cubstance is to be introduced into a retort, along with quick lime, and then subjected to heat. Ammonia is driven off in the form of gas and is to be collected in glass jars standing over mercury.—Ammoniacal gas is colorless, has a strong pungent smell, an acrid caustic taste and cannot be drawn into the lungs. Its specific gravity is 0.59027. Water absorbs 780 times its volume of this gas, and in this state is employed for chemical purposes. When the gas is mixed with chlorine a sudden combustion and detonation take place. The chlorine unites with the hydrogen of the ammonia and forms muriatic acid, whilst the azote is disengaged in the state of gas. The muriatic acid formed combines with a portion of ammonia and forms sal ammoniac. Ammonia is an alkali and possesses the properties distinguishing this class of substances in a very decided manner. It of course neutralizes acids, and the salts which it forms are numerous and of considerable importance.

CHLORINE.

This is a gaseous body of a yellowish-green color, a strong suffocating smell, and of a pretty strong astringent taste. If breathed, undiluted it destroys animal life, however, it not only supports combustion but possesses the remarkable quality of setting fire to many of the metals, even at the common temperature of the air, when beaten out into thin leaves, and introduced into it. The combinations of metals with chlorine are called *chlorides*. Chlorine possesses the property of destroying all vegetable colors, and of rendering vegetable bodies, exposed to its action, white. This property has occasioned the introduction of chlorine into bleaching, for, if unbleached linens be exposed to its action, the matter which gives them their gray color is destroyed, and the substance assumes a brilliant whiteness. Chlorine, however, must be used cautiously, for if applied in its pure, and not sufficiently diluted, state, it destroys the fibre of the cloth. Chlorine combines with oxygen in four different proportions two of them contain so much oxygen as to



BAY OF SAN FRANCISCO.

The above well executed engraving is an exact representation of the celebrated harbor of San Francisco, in California. Such is its immense size and the excellence of its natural protections, being defended by high mountains on every side, that it will contain all the ships in the world lying safely at anchor. It is the largest and safest harbor known. San Francisco is one of the most important ports in the Pacific ocean, and, before the war, was rapidly increasing. It is now in possession of the United States, having been recently captured after a slight resistance.

form acids, these are chloric acid and perchloric acid, but as the other two do not manifest any acid properties they are to be considered as oxides, and are called protoxide of chlorine and peroxide of chlorine. Besides uniting with oxygen, chlorine combines with hydrogen and forms the well known acid called

MURIATIC ACID.

If chlorine and hydrogen be mixed together in equal volumes and exposed to common day light in a glass flask, they will in a little time combine, and even explode in combining if exposed to sun light or the light of a candle, and 2 volumes of muriatic gas result. Its specific gravity is 1.8244, in its pure state this gas is transparent, colorless and elastic under very strong pressure into a liquid. Water absorbs this gas with avidity. One cubic inch at 69 deg. absorbs 417,822 cubic inches of the gas, heat is produced and, when cold, the bulk of the water is increased to 1.3433 cubic inches. This is liquid muriatic acid. With these proportions of constituents, its specific gravity is 1.1958, one hundred grains of it consist of 30.39 of real acid and 59.61 of water.—It is a colorless liquid and, when exposed to the air it smokes, because the gas exhaled condenses the moisture of the atmosphere. It extinguishes both flame and life, and is not inflammable. It is of a pungent, suffocating and somewhat of aromatic smell. It powerfully reddens vegetable blues. The best method of obtaining it is by pouring sulphuric acid upon an equal weight of sea salt, and collecting the gas, which is given off, over mercury. An immense number of salts are formed from the combination of muriatic acid with oxides such as common sea-salt, which is a muriate of soda. These are very extensively used, both in the arts and medicine. Chlorine combines with azote, and forms what is called

CHLORIDE OF NITROGEN.

This is an oily liquid, and the most powerful explosive compound known. In this respect it is one of the most dangerous substances of nature; it consists of four volumes of chlorine combined with one of azote. Chlorine combines with carbon, but the compounds are unimportant.

(*To be concluded.*)

Rather Caustic.

In Graham's Magazine, is the following epigram on a windy parson:

"Preaching is foolishness," he made
The text of his oration;
And all confessed that he displayed
A perfect demonstration.

A Gloomy Picture.

We shall not attempt to apologize for the present course of events; but we know no better way in the business of this world, than to endeavor to mitigate the evils thereof and ameliorate the condition of mankind as far as possible. The following remarks on the prevailing evils of the world, are extracted from a recent discourse on the subject by a man whom we highly esteem. If they should lead any to look for a better state of things, we have no objection.

THE GROANING CREATION.—The whole creation, animate and inanimate, give continual evidence of disorder and suffering; the hills and vales, the fertile fields and desert wastes,—the sea and dry land,—all are reduced to the torture of incessant travail, and but a single remedy, and that not available in this present state. The earth itself yields its increase as it were grudgingly, and demands an exorbitant fee, beforehand, in toil and sweat, from the husbandman; and even then it does not always keep its promise. Often the laborer goes to great pains to prepare his ground, and sows bountifully', but reaps sparingly: takes much seed into the field and brings little out. Or, if it keeps its promise, and yields a large increase, the elements and insects destroy it; or incessant storms and gales, or other causes, blast suddenly the labor of the busbandman.—So perfectly subjected are we, that you cannot think of an accessible position in the whole world, where there would be an exemption from this travail. Try it. Make yourself master of all science, and the politics and laws of all nations; secure the suffrage of a whole country; succeed to the highest pinnacle of power and fame, and receive the homage of the whole world, and what have you? But a "barren rock, too narrow for friendship, and too slippery for public repose." The envious eye of the ambitious will be upon you, watching for your halting; the inquisitive meddling of the fastidious will tease and perplex you, and will make you responsible for almost every local accident and mishap that occurs, and even their own personal failures. And there are those always ready to displace you as soon as they can, and make you, with disgrace, take the "lowest seat." The same liability to disappointment attends other callings and professions. The merchant, the mechanic, and the professional man, are all equally liable not to succeed;—and if they do, they are the subjects of envy and slander, and can rarely maintain their position of wealth, power or influence—so uncertain are human affairs.—Besides all this, their success is often ascribed to a studious address and management that have made others low and poor, while they grow rich and honorable; and what is worse than all, if they had not been selfish, they could not have risen so far above their fellows. Give them success in trade and ample fortune, social friends, splendid mansions and beautiful grounds, and all the acquisitions of Solomon,—and they must come to Solomon's conclusion: "I withheld not my heart from any joy; for my heart rejoiced in all my labor; and this was my portion. Then I look upon all the works that my hands had wrought and on the labor that I had labored to do; and behold all was vanity and vexation of spirit, and there was no profit under the sun." (Ecc. ii. 10, 11.) Any success that may be secured cannot be a bar to disappointment, reverses anddeath.

Light from Flowers.

The Cincinnati Commercial mentioned the fact some time since, of a remarkable phenomenon in natural history, as related by a Swedish lecturer, being nothing less than light from flowers. By experiment it was found that the marigold of an orange or flame color, emitted, at intervals of several minutes, two or three flashes of light in quick succession, and when several flowers in the same place emitted their light together, it could be seen a considerable distance. This phenomenon was observed in July and August, when the sky was clear, about sunset. The light has been observed by others and is supposed to be electrical, and to proceed from the petals only

RAILROAD INTELLIGENCE.

GREAT WESTERN RAILROAD.

This Canada enterprise seems to be gathering a new impulse. The Hamilton Express says:—"We understand that the arrangement is, that 10 individuals were registered for 10,000 shares on which they have paid 25s. per share; and that they have paid 5s. per share on the remainder.

RAILROAD FROM SYRACUSE TO ROCHESTER.

A notice appears in the Syracuse papers of application to the Legislature for a charter for a railroad from that village to the city of Rochester, "along and near the line of the canal between the two places, with a capital of $2,000,000."

DAYTON AND XENIA, OHIO.

The citizens of Dayton are preparing to construct a railroad from that place to Xenia, which will open a communication with Cincinnati, Indianapolis and St. Louis.

The project of a railroad from St. Louis, Mo., to Indianapolis, Indiana, through Terre Haute, connecting with the Madison railroad, is growing into favor. At St. Louis, measures have been taken to have the route surveyed.—Such a road is much needed, as the country which it has to pass is shut out from market.

PITTSFIELD AND NORTH ADAMS LINE.

The net earnings of the Pittsfield and North Adams Railroad, from its opening in October th the 1st inst, a period of about seven weeks, were:—From passengers, $311,074; from freight. $1,160.29. Total, $4,271.03.

EASTERN RAILROAD.

The Salem Gazette says: "The double track on the Eastern Railroad has been completed, so that hourly trains may run between Salem and Boston, at the seasons when the amount of travel may render it necessary.

CAPE CODBRANCH.

This road which but a few days since we mentioned as merely projected, has not only been put under contract, but the grading is actually in progress.

THE ESSEX RAILROAD.

This road is completed as far as South Danverse, Mass. We have been taken by surprise by this intelligence, not having yet learned its entire location.

DIVIDENDS.

The Old Colony Railroad dividend is three per cent, for the last six month, payable on Monday, Jan. 4th.

The Boston and Lowell Railroad Corporation have declared a semi-annual dividend of four per cent, payable on the first day of January next.

The Eastern Railroad Company has declared a semi annual divided of four per cent.

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LATE NEWS.

FROM THE ARMY.—We have dates from Brazos to the 16th, ult.

Two regiments of Indiana volunteers, and Captain Taylor's Battery, had marched from Monterey to reinforce Gen. Worth at Saltillo. The division of Gen. Twiggs had moved towards Victoria, between Saltillo and Tampico. Gen. Taylor, was about to move in person on Victoria, with a column of 4,500 men. He would make no further demonstrations on San Luis de Potosi, until he had heard from Washington. The Alcalde of Monterey, his son, and several other persons had been imprisoned by Gen. Taylor for furnishing money, horses, &c., to deserters from our army, to enable them to escape. Gen. Wool was at Parras with 1000 men, and Col. Riley at Monte Morales with a similar force. On the 14th inst Gen. Pillow was to move on Victoria.—Santa Anna has sent a detachment of 1000 men to destroy the water tanks on the road between San Luis Potosi and Saltillo. General Wool's position at Parras is said to be a hundred miles north of Chihuahua. Victoria is half way between Monterey and San Luis.

FROM MEXICO.—It is reported that Santa Anna had threatened to retreat to Queretaro, if government did not send him the funds he had demanded. The aristocracy of money and land are tired of the war, and Santa Anna's retrogade movement may exact pacific demonstrations from Congress. Judging him "by contraries," he is favorable to peace, and will not meet the "Yankees" in person.

Loss of the Somers.

Intelligence has been received that the U. S. Brig Somers was thrown on her beam ends on the 8th ult. by a violent and sudden squall from the north, and sunk in about ten minutes. Of 80 men on board, 36 including several officers were lost. Of those who escaped several drifted on spars, &c. to the shore, and were made prisoners by the Mexicans.

Those Unfeeling Robbers.

It is gratifying to know that the villians who robbed the poor German emigrants at Albany, a few weeks since, have a prospect of something like justice. The circumstances of the robbery were briefly as follow :—A poor, hard-working, but interesting family of Germans, having accumulated by incessant toil a few hundred dollars in money, came to this country, and were proceeding westward to procure and cultivate some land for a small farm, and having proceeded as far as Albany obtained lodgings at a public house ; the wife and mother carefully acting as treasurer, and keeping their money in a small hand basket. There were several children in this family, and being in a strange country, and not even understanding the language, their sole dependence was apparently on the little treasure of gold. When about to proceed on their journey next morning, the mother left her basket on a chair in the bar room a moment, while she stepped into another room, and on returning the money had disappeared. So bitter was the affliction, the cries and sobbing of the mother with her children excited the attention and deep sympathy of the people in the street, and an officer was procured, who, after several days diligent search and investigation, found some clue to the robbers, one of whom was the bar-keeper. These men were arrested and brought to trial, and two of them have been sentenced to four years and six months in the State Prison We have not learned what amount of the money was recovered, but understand that the suffering family have been enabled to proceed on their journey.

P. S. Since the above was in type, we have learned that $740 was recovered from the robbers : and that $750 was contributed by the citizens of Albany, which together was equal to the original loss.

A New York Orchard.

R. L. Pell, of Ulster Co., has an apple orchard containing 20,000 Newton pippin trees. He ships most of them to England.

To the Inventors of the United States.

It is probable that at the present session of Congress a law will be passed of the highest importance to your rights of property in the fruits of your labor time and capital.

There are three propositions before the Committees of Congress. First, to suffer the present law to stand by which the inventor is in most cases ruined, and the doctrine that every application for renewal must be met and opposed as against the general good of society, and every inference shall be against the inventor until he can disprove ungenerous suggestions; as if the fruits of an inventor's industry were not as unalterably his, as the fruits of the industry of any other class of citizens of theirs.

The second proposition is that of expediency. It has some good suggestions and some bad. It gives an advantage to inventors, but places it in the hands of whatever powers there may be in the Patent Office to say who shall enjoy its benefits and who shall not, and if by any mischance a corrupt commissioner of patents, or malicious mercenary examiners should come in, a sop would always have to be thrown to Cerberus and patents would be up for sale in effect. At least this is the fear of the writer of the third proposition which was published in this paper some time ago and is now known as "Rosevelt's Patent Law."

Its main principles have been adopted by a majority of the Committee on the Patent Laws of the National Association of Inventors while the second proposition of expediency is that of the Convention of Inventors. The most active and influential—and, it is believed, a majority of the Directors of the American Institute have also subscribed to Rosevelt's Patent Law which sustains the principle that an inventor's rights of property should be placed on the same level, as other property is now held by the common law That inventors shall have the right to record their patents as a man may enter a claim to land or record a deed; and, if public policy is against the individual who has invented any great improvement, then as in cases where the public desire a right of way over private property for a road or a canal, commissioners shall be appointed to appraise and award the value to the first inventor and thus only shall the fruits of the labor and ingenuity and capital of inventors become public property within a million of years, since the constitution can protect only for limited terms. He or some pretenders to strictness of construction of the fundamental law, cry out "there is a lion in the way!"

Others say the public have the right of "eminent domain" in all new inventions as if the government had provided men, money and material to make conquests in the untrodden fields of genius over the elements of nature.

When government assists by such means to make conquests and protect them then will it have a right ro claim the eminent domain but not before.

All inventors who may see this brief address and who coincide in the views herein expressed will please notify the writer in the most convenient way, and add, at least their names to the application he intends to make to Congress in support of the foregoing Rights of inventors. CLINTON ROOSEVELT.

No. 23 Chamber st., N. Y.

Notice.

☞Any of our subscribers at Newburgh, Canterbury, Athens, Hudson, Valatia, Walden, or any other places in that vicinity that gave their names to one John Murray, formerly an agent are informed that unless they remit to the publishers when the time paid for has expired, their papers will be stopped, and all those who have not made their first payment are likewise informed that unless they do so at at once, their papers will be discontinued.

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The public are cautioned against paying any money, to John Murray of Newburgh, N. Y. our account. MUNN & CO.

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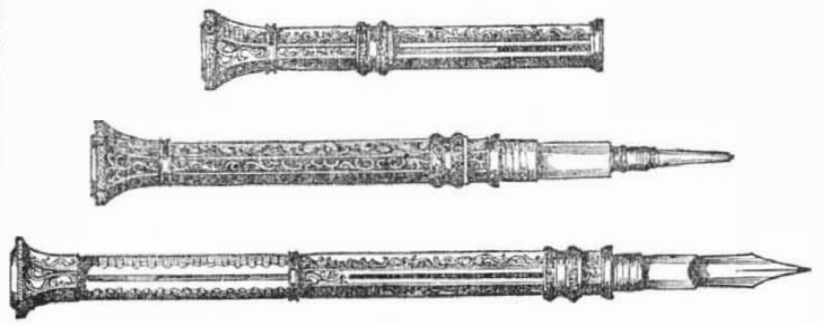

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In the short space of 2 3-4 inches is contained a Pen, Pencil, and a reserve of leads, and by one motion slides either the pen or the pencil out and extends the holder to six inches, which is but little more than half the length, when shut up, of the common pen holder, but when extended is one fourth longer. This article is secured by two patents, and the Manufacturers are now ready to receive orders for them in any quantity, either of Gold or Silver, together with his celebrated ever pointed Gold Pens, which need no proof of their superiority except the increased demand for the last six years, and the numerous attempts at imitation.

A. G. BAGLEY, No. 189 Broadway.
New York, Sept. 1, 1846. o24 tf

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☞ THIS paper circulates in every State in the Union, and is seen principally by mechanics and manufacturers. Hence it may be considered the best medium of advertising, for those who import or manufacture machinery, mechanics tools, or such wares and materials as are generally used by those classes. The few advertisements in this paper are regarded with much more attention than those in closely printed dailies.

Advertisements are inserted in this paper at the following rates :

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GENERAL PATENT AGENCY.

THE subscriber has established an agency at his warehouse, 12 Platt street, New York, for the protection and general advancement of the rights and interests of Inventors and Patentees.

The objects of this agency are more particulary to aid and assist Inventors and Patentees in effecting sales of their inventions and of goods and wares made therewith—and also for the sale and transfer of Patent Rights.

Arrangements have been made with a lawyer familiar with the Patent Laws, who will attend to the legal branch of the business upon reasonable terms. Satisfactory references will be given. Applications may be made to the undersigned personally, or by letter, post paid. SAMUEL C. HILLS,
j2 3m* General Patent Agent.

BLACK LEAD POTS.—The subscriber offers for sale in lots to suit purchasers, a superior article of BLACK LEAD POTS, that can be used without annealing. The price is low, and founders are requested to make a trial.
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To those desiring Drawings or Specifications, Mr. B. has the pleasure of referring to Gen. Wm. Gibbs McNiel, Civil Engineer, Prof. Renwick, Columbia College, Prof. Morse, Inv. Tel.

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THOMAS PROSSER, Patentee,
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Superintendant of Elliot Mills.
d12 6m. Newton Upper Falls, Mass.

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Improvements in Embossing, &c.

Charles F. Bielefield of London, has obtained a patent for various improvements in embossing paper and other materials, which improvements are described as follows:

This invention consists, firstly, of manufacturing mouldings, to be used in making of picture frames, cornices, and other articles:

Secondly, of combining calico and other fabrics, and leather, with paper. papier mache, and other preparation of plastic fibrous matters, so as to produce embossed articles of a stronger character and more durable than papier mache; and,

Thirdly, in employing india rubber in combination with other matters, and with fibrous material, and paper, calico, and other fabrics; and leather, in the manufacture of embossed surfaces, for architectural and other purposes.

In manufacturing mouldings from paper, calico, leather and other fabrics with or without other articles combined, the patentee employs a roller or rollers, heated by steam or by other means. The surface of the roller having been turned, or formed to the design of mouldings, desired to be made, and if it is intended to produce a pattern, or embossing on the surface of the mouldings, then the roller is to be engraved or produced thereon, and with this roller a second roller is used corresponding with the engraved one, this is when mouldings are to be made separate from wood, and when the mouldings are to be made on wood, then a bed is used moving under the roller, at the surface speed of the roller. In manufacturing mouldings from paper, calico, leather, and other fabrics, with or without other articles, sheets thereof are prepared of a thickness suitable for the streng'h of mouldings, and this may be done in various ways. Supposing the mouldings are to be on wood, then a thickness of paper is pasted on the surface, according to the depth of the embossing; when there is to be no embossing to the mouldings, then the covering of paper may be very thin, and the paper so applied being nearly dry, the wood is passed under the roller, which gives a finished surface to the moulding, by embossing the roller, simply planishing the surface, when no embossing surface is cut on the rollers; or papier mache on the wood can be used, either covered with paper or not, and when dry or nearly so, the wood so prepared is to be subjected to the action of the rollers, to complete the surface of the mouldings. And when making mouldings without wood, then the fibrous materials are made into sheets with paper, or calico, or other woven fabric, or leather, as herein described, as the surface which is to be embossed, and these narrow sheets may be formed into plain or embossed mouldings, by passing them between the rollers, or between a roller and a counter surface, or bed moving under the roller, as before explained. Or the preparations of fibrous materials, hereafter described, where India rubber, glue, grinell and glycerine, are used in preparing a pulpy or paste matter, may be used in making mouldings, and also compositions where India rubber and gluten are employed, as hereafter explained, may be used in producing mouldings, to the first part of this invention, which consists of making mouldings by rolling surfaces from preparation of fibrous matters.

The strips, or narrow sheets of prepared fabric, being prepared, it is to be passed between the rollers, as they are caused to revolve by suitable gearing, there being shields on either side of the rollers to prevent the fabric going incorrectly, and also to prevent the fabric winding round either of the rollers. The fabric should be in a partially dried state, and so as to require considerable pressure to obtain the shape of the moulding, and for producing the embossing, so that when once produced it will not readily be pressed out of shape and at the same time the fabric should not be perfectly dry. When the mouldings are to be placed on the surface of wood, then the wood is to be shaped to the figure of the moulding, and any of the preparations herein mentioned, are to be applied thereto as a coating by means of paste, glue or other suitable cement; but this coating need not be so thick as the sheets of material used, as above mentioned, for making mouldings without wood, and which require to be of such strength as to maintain their form, after receiving it, by their own stiffness. When using wood the lower roller is not required, but the moving bed is employed, upon which the wood is fixed, and by passing under the roller the surface of the moulding is completed thereby, and in place of employing the lower roller. When making mouldings from the material mentioned, the moving bed may be employed, having a moulding fixed thereon, corresponding with the roller, and the fabric being laid in such moulding, and the bed moving through as the roller revolves, the pressure of the roller will cause the fabric to take the form of a thin moulding, and will emboss it on the surface, when the surface of the roller is engraved. In the event of leather being used, according to this part of the invention, for obtaining mouldings, then leather is not only used, but paper mache, or other preparation of fibres, may be combined with it so as to give strength to the leather, as separately the leather would not maintain the shape of a plain or embossed moulding.

[*To be continued.*]

SCIENTIFIC MEMORANDA.

[Communicated for the Scientific American.]

A kind of glass soluble in water, may be made as follows: Mix intimately 200 grains of silica (fine sea sand) and 600 grains of fine carbonate potassa; fuse the mixture in a crucible capable of containing four times as much.—Carbonic acid escapes, and the silica and potassa combine and produce glass. Pour out the glass on an iron plate, and dissolve it in water, the large quantity of alkali rendering it soluble in this fluid. The compound formed in this manner constitutes pure *silica soap*, having all the cleansing qualities of common soap.

The amount of alcohol in stout Porter is about six per cent and in strong Ale 8 per cent. The alcoholic part of such liquids stimulates but gives no actual nutrition; the only nutritive part is the undecomposed starch and gum not changed into saccharine material.

The simplest method of preserving meat for any great length of time, is to enclose the meat in tin cases, leaving only a small hole in the closely soldered lid. The air may then be expelled by dipping the cases for a minute into steam; on lifting them out a drop of solder quickly placed on the hole prevents the rush of air back into the vessel. On this principle of excluding the air cases of preserved meats are manufactured for cabin stores on long voyages.

Sugar can be produced by boiling one part of starch in twelve parts of water, and allowing the compound to stand for a month or so. At the end of this time about one half the quantity of starch is converted into sugar, a fifth part into gum, and the remainder is found to be a starch paste somewhat altered.

A white and black ribbon rubbed against each other between the finger and the thumb, exhibit electrical phenomena in a very marked manner.

Water, in its ordinary liquid state is an excellent conductor of electricity, yet, when it appears in the solid form its conducting power is much impaired, and at a low temperature ceases altogether.

A variety of experiments in cooking by gas, have been recently made in London. The great feature of the economy of the use of gas is that it can be turned off when not wanted, and is far more cleanly. In the experiments alluded to, the gas ascended from perforated pipes, in the form of a gridiron, through a bed of pumice stone, which, being pourous and fireproof, soon became of a glowing red heat, and every operation of cooking, frying, broiling, stewing, roasting, boiling, were performed in the most easy and perfect manner.

The best known form of apartment for proper distribution of sound in buildings designed for large auditories, is that in which the length is from one third to a half more than the breadth, and the height somewhat greater than the breadth, and having a roof bevilled off all round the sides. This species of ceiling, from being lower at the sides than centre, is in all cases best suited for conveying sounds clearly to the ears of auditors.

The Metals that are but imperfectly known, not having, as yet been applied to any useful purposes, are:

1*st. Uranium.* which has an iron grey color, of considerable lustre, and when heated to redness, takes fire. It produces a dark green protoxide, which gives a black color to porcelain; and a fawn colored peroxide, which communicates to porcelain an orange color.—Its specific gravity is 9.

2. *Molybdenum*, which has a silver-white color, is quite brittle, and has a specific gravity of 8.636.

3. *Tungsten*, which is of a greyish white color, very hard and heavy; its specific gravity is 17.4.

4. *Columbium.*—When burnished this metal assumes a yellowish-white color and a metallic lustre.

5, *Titanium.*—This metal has a copper red color and considerable brilliancy. It crystalizes in cubes, and is hard enough to scratch rock crystal. Specific gravity 5.3.

All these metals combine with oxygen, but the acids and oxides so formed have not, as yet, been applied to any useful purposes.

A compound of iodine and azote is as explosive as the celebrated gun cotton.

When the air at any particular place becomes heated or rarefied, it ascends by virtue of its greater lightness, leaving a vacancy which the neighboring air rushes in to supply. This is one of the chief causes of winds.

That water is a vehicle of sound as well as the air, is proved by the fact that a bell rung under water can be heard above; and if the head of the auditor be also under water, it will still more distinctly be heard.

The *atmosphere* which wraps the whole earth round to an elevation of about forty five miles, is so thin at the height of three miles, say, for instance, on the summit of Mont Blanc, one of the Alps, that breathing is there performed with some difficulty; and the density of the air continues to diminish, it is believed, and at the height of forty five miles it ceases altogether. So dense are the lower regions in proportion to the higher, that one half of the entire body of air is below a height of three miles, the other half being expanded into a volume of upwards of forty miles.

If we take a pound weight of air near the level of the sea, and another pound weight at a spot a mile above the sea, we shall find that each pound contains the same quantity of heat, but, in the case of that taken near the sea, the air will feel warm, and, in the other case, the air will feel cool. This seems a contradiction, yet it is a truth. Aloft the air is as warm as below, but there is less of it: the particles are more widely asunder, and this produces the effect of greater coldness.

Water boils at 212 degrees under the common pressure of the atmosphere at the sea's level, but by removing a portion of the pressure either by an air pump or by ascending a height, the vaporic or boiling point will be reached correspondingly sooner. On this account we might, with tolerable accuracy, ascertain the height of mountains by noticing at what degree of heat by the thermometer water boiled. For instance, boil pure water in an open vessel at the bottom of the elevation, and observe on the thermometer, the point at which it boils. Boil it again at the top of the mountain and observe again the point by the thermometer at which it boils, and the difference of temperature multiplied by 530 feet will give a close approximation to the height of the upper, above the lower station.

Fill a glass to the brim with water, and lay a piece of paper over the whole surface of the lipuid: then turn the glass carefully upside down, holding on the paper by the hand, the water will remain in the glass, being upheld by the pressure of the atmosphere against the paper.

In consequence of the different size and density of the sun and planetary bodies, the weight of bodies differ in each. On the surface of the sun our pound weight would weigh upwards of twenty-seven pounds. On the surface of Jupiter our pound would weigh 2 pounds 4 ounces, and on the surface of the moon, our pound would weigh only the fifth part of a pound.

Take an empty basin and place it on a table then lay a shilling at the bottom of the basin in such a position that the eye of the observer will not see it. Fill the basin with water and the shilling, though lying unmoved, will come completely into sight, the ray of light producing vision in the eye being bent on emerging from the water, has all the effect of conveying our sight round a corner.

An object glass of a microscope having one-eight of an inch of focal distance, and so placed as that the image of the object is formed at six inches, the image will be of a diameter forth-eight times as great as the object, and when viewed though an eye-glass of half an inch focus, it will appear magnified twelve times more or will appear 30,000 times larger than the object.

In Paris there is a school called the Royal School of Mining. The ordinance of regulations does not state that candidates for admission must be French though they must speak the French language The very best education that can be given is afforded to the pupils who propose to devote themselves to mining pursuits. At one of the late examinations, a young gentleman form England stood first in mineralogy, metallurgy, and theoretical and practical chemistry.

Depth of the Gulf Stream.

The Savannah Republican says that Lieut. Bache, of the U. S Surveying brig Washington, whose loss at sea has been so much deplored, succeeded, after repeated attempts, in ascertaining at one point the depth of the Gulf Stream. The length of the line out was 1200 fathoms, or about one mile and a third. This is probably three-fourths of a mile deeper than plummet ever sounded before.

THE NEW YORK

SCIENTIFIC AMERICAN:

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